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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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ART UNIT	PAPER NUMBER
3663	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/517,020	DAHLBACK ET AL.	
	Examiner	Art Unit	
	Alexandra Awai	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-13 and 15-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-13 and 15-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 3/1/2007 have been fully considered but they are not persuasive. The limitations of claims 2 and 14 have been incorporated into claims 1 and 13 respectively. In the amendment filed 3/1/2007, claims 1, 3, 6, 8, 12, 13, 15, 18 and 20 were amended, new claims 23-26 were added, and claims 2 and 14 were cancelled. In the supplementary amendment filed 3/6/2007, claims 3, 7, 15, 23 and 25 were amended. The amendments to the claims do not appear to alter the scope of the claimed invention. As will be further explained in sections 3 and 5, the rejections under 35 U.S.C. 101 and 35 U.S.C. 112, second paragraph of claim 12 have not been overcome. Similarly, because Applicant has not persuasively addressed the actual combination of Dahlbäck and Foster et al. as set forth by Examiner, but rather has directed arguments to an incomplete interpretation of the rejection, the claim rejections under 35 U.S.C. 103 are maintained.

Examiner acknowledges Applicant's comments that additionally describe the invention on pages 9-11 of the Remarks. On page 11 of the Remarks, Applicant notes that because the final anneal in the Dahlbäck reference is according to the prior art, that this reference fails to disclose or suggest the invention of claim 1. In the previous Office Action, Examiner freely admits that "Dahlbäck does not explicitly state the degree of recrystallization achieved using the method, or that the final annealing is carried out at a temperature between 485°C and 550°C" (p. 5). However, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208

USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Moreover, Dahlbäck makes the following statement:

> "It has also been proved, according to the present invention, that by choosing an optimum composition of the inner layer, the effect of manufacture, with chosen heat-treatment parameters for all the heat treatments, can be further improved" (col. 4, lines 5-9).

It would be clear to any person of ordinary skill in the art that by further optimizing the composition of the inner layer and heat-treatment parameters, that the effect of manufacture of the disclosed invention might be even further improved. It is within the purview of the skilled artisan to adjust alloy composition and heat-treatment parameters within known ranges. Accordingly, the fact that there is no explicit exhortation to carry out the final anneal in some other manner in the Dahlbäck reference is not relevant to the case of obviousness.

Although Applicant mentions that alternative methods disclosed by Foster et al. for preparing fuel element cladding tubes "concern samples produced" (Remarks, p. 12), it is important to note that these different alternatives are directly relevant to the claimed subject matter, which includes alternative embodiments of a nuclear reactor fuel element cladding tube. The fact that Foster et al. does not identify a preferred alternative is irrelevant, as is Applicant's speculation as to which alternative might be considered preferred. All of the alternative methods are available as prior art, and none of them teach away from the claimed invention of the instant application. Examiner never suggests that Foster et al. alone encompasses the feature of an inner component that is completely recrystallized along with an outer component that is only partly recrystallized. Rather, Examiner notes that Foster et al. teach the manufacture of a cladding tube wherein the liner is relatively more recrystallized than the outer component (col. 7, lines 3-16). This clearly diverges from the "traditional" method of manufacture discussed by Applicant, and

is relevant to the claimed invention. As discussed on page 4 of the instant specification, Foster et al. also teach that by adjusting heat treatments – e.g., the final anneal – the levels of recrystallization in the inner liner and outer component may be modulated according to desired effects.

Foster et al. not only provides teachings relevant to three particular alternatives, but also discloses relevant facts regarding modulation of metalworking parameters. Examiner has considered these teachings, as well as similar teachings found in Dahlbäck, in view of MPEP § 2144.05(II). Instead of addressing the cited teachings of Dahlbäck combined with the cited teachings of Foster et al., particularly regarding the step of performing the final annealing at or below 550°C along with the motivation of preserving enhanced corrosion resistance, Applicant has separately discussed selected teachings of the two references and summarily concluded that no combination of the references would result in the claimed invention. Conspicuously absent is any mention of MPEP § 2144.05(II). Examiner maintains that because the material and temperature ranges are found within the cited references, especially given the motivation of the skilled artisan to optimize parameters, the limitations of the claims are, in fact, taught and suggested by the combined references.

After drawing the aforementioned unsupported conclusions, Applicant makes certain erroneous or mischaracterizing statements in the Remarks. For example, Applicant states the following:

> "The Examiner also refers to column 4, line 51 in Foster in order to show that the temperature of the final anneal should be performed below about 600°C, for example at or below about 550°C. However, such a final anneal temperature is the case for all three examples described in columns 6-7 in Foster. Consequently, the suggested final anneal temperature does not in any way indicate that the final anneal should be carried out such

> that a cRXA is obtained in the inner component while a pRXA is obtained in the outer component" (Remarks, pp. 13-14).

At no time does Examiner refer to any teaching in order to show that some step ***should*** be performed, and no such showing is required for the case of obviousness. Examiner refers to certain parameters in the prior art to show that they ***may*** be used, and that such use is not considered an innovation, but rather an application of knowledge widely available to those of ordinary skill in the art. Additionally, it does not immediately follow that because none of the three examples disclosed by Foster et al. (alone) meet all aspects of the claim language, that the teaching of a final anneal temperature below about 550°C fails to indicate that the final anneal may be carried out such that a cRXA is obtained in the inner component while a pRXA is obtained in the outer component. Applicant has failed to acknowledge that if the final anneal temperature of Dahlbäck is modified to be below about 550°C according to the teachings of Foster et al., then an obvious hypothetical method encompassing this modification completely encompasses the parameters that allow the instant invention to achieve the feature wherein a cRXA is obtained in the inner component while a pRXA is obtained in the outer component.

Instead, Applicant makes the following misleading statement:

> "Foster suggests that the final anneal temperature should be performed below about 600°C, preferably at or below about 550°C. This requirement is already fulfilled in the Dahlbäck document, since the final anneal is here performed at 570°C. However, as explained before, this anneal results in a cRXA in both the components" (Remarks, p. 14).

While "570°C" is within the range of "about 600°C, preferably at or below about 550°C", the latter clearly includes temperatures – i.e., temperatures below 570°C – that are not disclosed in Dahlbäck, but are relevant to claim limitations. That is, Foster et al. clearly teach that the final anneal may be performed at or below about 550°C in order to achieve predictable benefits, and

this teaching is not "already fulfilled in the Dahlbäck document," and neither is it "contrary to the teaching of Dahlbäck" in the sense that it teaches away. The teaching provided by Foster et al. is an additional teaching that is associated with advantages that would be apparent to the skilled artisan. Although Dahlbäck teaches annealing the tube at 570°C for 1.5 hours, Dahlbäck does not advise the reader that it is severely disadvantageous to lower the annealing temperature by 20°C, or disparage an embodiment wherein the inner liner is relatively more recrystallized than the outer component.

With regard to Applicant's comment that there is no indication that if the final anneal were performed at a lower temperature, that the claimed features would be produced, the question is not whether the skilled artisan would have intentionally arrived at the claimed embodiment. Rather, the relevant issue is, if the skilled artisan had arrived at the claimed embodiment through optimization within prior art conditions or through routine experimentation, whether or not the optimized result would be considered non-obvious. Foster et al. not only teaches the required temperature range, but also teaches that 1) it is desirable to produce a cladding tube wherein the inner liner is relatively more recrystallized than the outer component and 2) that there are advantages associated with having a final anneal temperature of below about 550°C. The skilled artisan, seeking to achieve these advantages by maintaining a final anneal temperature of below about 550°C while modulating anneal duration through routine experimentation would achieve an optimized cladding tube that possesses the desirable feature of item 1 above without ever diverging from parameters or processes that are conventional. This optimized cladding tube would meet the limitations recited in the claims. Even if the "aim is normally to achieve cRXA in both components" (Remarks, p. 14), Foster et al. provides explicit

teachings that skilled artisans have previously conceived of an alternative aim that is in line with the instant invention. The advantages associated with maintaining a final anneal temperature of below about 550°C are sufficient suggestion, along with the normal desire of scientist or artisans to improve upon what is already generally known by optimization, to suggest that the anneal may be carried out such that a recrystallization according to the present invention is obtained.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claim 12 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966). Although Applicant has altered the claim's preamble, there are still no steps involved in the process recited in the claim as required for a proper definition of a process.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 12 provides for the use of a cladding tube, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced. As stated above, Applicant's amendment fails entirely to add any active, positive step delimiting how the use is actually practiced.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1, 3-13 and 15-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlback (EP 0 674 800 B1) and Foster et al. (4,933,136).

Dahlback discloses a zirconium cladding tube with internal liner and a method for fabricating it. The disclosed cladding tube comprises an outer component consisting of a zirconium alloy such as Zircaloy 2 or Zircaloy 4 (col. 5, lines 22-24) and an inner component consisting of a zirconium-tin alloy with 0.1 to 1% tin, 200-450 ppm iron, and less than 600 ppm oxygen (col. 6, lines 4-16). The inner component is joined to the outer component in the conventional manner (i.e., metallurgical bonding) and subsequently the final annealing is carried out at 570°C for 1.5 hours (col. 6, lines 39-45). These teachings are particularly relevant to claims 1, 4-8, 11, 13 and 16-20. With regard to the various ranges recited in the claims, see MPEP § 2131.03, which states:

> "[W]hen, as by recitation of ranges or otherwise, a claim covers several compositions, the claim is 'anticipated' if one of them is in the prior art." *Titanium Metals Corp. v. Banner*; 778 F.2d 775, 227 USPQ 773.

Dahlback does not explicitly state the degree of recrystallization achieved using the method, or that the final annealing is carried out at a temperature between 485°C and 550°C.

The degree of induced recrystallization is dependent on the material composition being annealed, and the parameters – namely temperature and duration – under which the annealing takes place. Those skilled in the art are well-versed in modulating these parameters in order to achieved the desired degree of recrystallization in balance with other desired material qualities. Foster et al. in particular teaches the manufacture of a cladding tube wherein the liner (0.003-0.005 wall thickness) is relatively more recrystallized than the outer component (0.31 wall thickness) (col. 7, lines 3-16). Foster et al. also disclose performing the final annealing at or

below about 550°C preserve the enhanced corrosion resistance of an alloy composition substantially similar to that used in Dahlback (col. 4, line 51). Lowering the annealing temperature by 20°C to be at or below about 550°C – and possibly altering other parameters such as the duration to compensate – in order to achieve optimal material properties in the cladding tube would have been no more than an optimization within prior art conditions or through routine experimentation (see MPEP § 2144.05.II). Indeed, it may be possible to achieve the claimed properties at the exact prior art parameters.

Because the degree of recrystallization is completely dependent on limitations established above to be known or obvious, the claimed limitations regarding recrystallization levels are also encompassed by the cited teachings. That is, if the skilled artisan were to implement the aforementioned obvious method using the known alloys, the degrees of recrystallization recited in claims 1, 3, 13, 15, 23 and 25 would be inherent to the resulting cladding tube. As to limitations which are considered to be inherent in a reference, note the case law of *In re Ludtke*, 169 USPQ 563, *In re Swinehart*, 169 USPQ 226, *In re Fitzgerald*, 205 USPQ 594, *In re Best et al*, 195 USPQ 430, and *In re Brown*, 173 USPQ 685, 688.

Claims 12 and 22 respectively set forth the use of a cladding tube and a fuel assembly comprising the cladding tube. Both of the cited references demonstrate that the mere use of cladding tubes in nuclear reactors is not novel, given that the features of the particularly claimed cladding tubes are known or obvious. Applicants' own description of Fig. 1 on page 9 of the specification demonstrates that the fuel assembly and the conventional components that comprise it are also known.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexandra Awai whose telephone number is (571) 272-3079. The examiner can normally be reached on 9:30-6:00 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA
May 23, 2007

JACK KEITH
SUPERVISORY PATENT EXAMINER